

Patent Claims:

1. An attachment for or on an illuminating device of preferably uneven surfaces, in particular tooth surfaces, and/or for a or on a detection unit, in particular an intraoral camera, whereby the illuminating device and/or the detection unit have at least one light source, characterized in that the attachment (1) comprises a solid, transparent, preferably homogeneous, colourless and/or optically clear conductor (2) having an, in particular, essentially flat, light-admission surface (6) and a light-exit surface (4), and a transparent, preferably homogeneous, colourless and/or optically clear pad (3) adjoining the conductor (2) or the light-exit surface (4) of the conductor (2) in a form-locking and optionally material-locking manner.
2. The attachment according to claim 1, characterized in that the conductor (2) consists of a rigid and hard first material, e.g. of glass or plastic, preferably polymethyl methacrylate, polycarbonate, polyamide, styrene acrylnitrile (SAN), polystyrene, sealing compounds or casting resins based on epoxide resin, polyurethane resin, organo-polysiloxane or the like, in particular having a ball-pressure hardness of >100 measured according to ISO 2039-1.
3. The attachment according to claim 1 or 2, characterized in that the pad (3) is formed as a solid body and consists of a ductile, flexible and/or elastic second material, e.g. of silicone or a silicone derivative or polyurethane, in particular having a shore-A-hardness of <40.
4. The attachment according to any one of the claims 1 to 3, characterized in that the first material has a higher refractive index than the second material.
5. The attachment according to claim 1 or 2, characterized in

1 that the pad (3) is designed as a hollow body whose preferably
2 very thin or foil-like casing consists of a ductile, flexible
3 and/or elastic material, e.g. of a silicone or a silicone
4 derivative or polyurethane, and is filled with a transparent,
5 preferably colourless and/or optically clear medium, e.g.
6 a liquid or a gel, in particular water, a sodium chloride
7 solution, etc.

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9 6. The attachment according to any one of the claims 1 to 5,
10 characterized in that the conductor (2) has the geometric
11 form of a body with an upper part (11) in the form of a cylinder
12 or a parallelepiped, preferably a rectangular parallelepiped,
13 and optionally a lower part (12) molded on or adjoins the
14 upper part (11) with its base centrosymmetrically in one piece
15 in the area of the light exit, said lower part (12) being
16 in the form of a cone, a truncated cone or a cone with a rounded
17 tip, a pyramid, etc.

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19 7. The attachment according to any one of the claims 1 to 6,
20 characterized in that the conductor (2) is formed in two
21 pieces consisting of the upper part (11) and the lower part
22 (12), preferably with the same basal surface, whereby the
23 upper part (11) and the lower part (12) are connected in a
24 material-locking manner, in particular by gluing with a
25 transparent, optically clear adhesive which preferably has
26 a refractive index that lies between the refractive indices
27 of the upper part (11) and the lower part (12).

28
29 8. The attachment according to any one of the claims 6 to 7,
30 characterized in that the flanks or the sheathing of the lower
31 part (12) or the light-exit surface (4) have an angle of slope
32 (α) vis-à-vis the inclination of the light-admission surface
33 (6) of maximum 60° , in particular of maximum 53° , preferably
34 of maximum 45° .

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36 9. The attachment according to any one of the claims 1 to 8,
37 characterized in that the pad (3) has a recess complementary

1 to the lower part (12) for accommodating the conductor (2)
2 or the lower part (12).
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4 10. The attachment according to any one of the claims 6 to 9,
5 characterized in that the tip (7) of the lower part (12)
6 essentially ends in a plane with the surface of the pad (3)
7 facing away from the light-exit surface (4) of the conductor
8 (2).
9

10 11. The attachment according to any one of the claims 1 to 10,
11 characterized in that a carrier part (13) for mounting or
12 handling or fastening components is fastened or clamped to
13 the attachment (1), in particular to the conductor (2),
14 preferably in a notch or groove (20) of the conductor (2)
15 extending in peripheral direction.
16

17 12. The attachment according to any one of the claims 1 to 11,
18 characterized in that a diffusing lens (19) fastened, in
19 particular, to the carrier part (13) or to the conductor (2)
20 is provided at or in front of the light-admission surface
21 (6) of the conductor (2), preferably between the
22 light-admission surface (6) and the light source (21).
23

24 13. The attachment according to any one of the claims 1 to 12,
25 characterized in that the light source (21), e.g. light diodes,
26 is fastened at or in front of the light-admission surface
27 (6) of the conductor (2), in particular in the centre or in
28 a circular manner about the median axis (14) of the conductor
29 (2), in particular to the carrier part (13).
30

31 14. The attachment according to any one of the claims 1 to 13,
32 characterized in that the detection unit (15), in particular
33 an image-recording and/or generating and/or transmitting
34 device, in particular a video camera, e.g. an intraoral camera,
35 or a CCD chip, is fastened to or in front of the
36 light-admission surface (6) of the conductor (2), in
37 particular in the centre or centrosymmetrically to the median

axis (14), in particular to the carrier part (13).

15. The attachment according to any one of the claims 11 to 14, characterized in that a handle (16) can be inserted or mounted on or in the carrier part (13), whereby a recess (17) is preferably formed in the carrier part (13) through which the conductor (2) is connected in an optically conducting manner with the detection unit (15) and/or the light source (21).

16. The attachment according to any one of the claims 1 to 15, characterized in that the light source (21) and the detection unit (15) are integrated in the handle (16), in particular in the top of the handle (18) close to the carrier part (13), or that the light source (21) and/or the detection unit (15) are arranged outside of the attachment (1) in an external component and are connected with the conductor (2) in an optically-conducting manner via at least one light transmitting unit provided in the handle (16) or in the top of the handle (18), e.g. a mirror or a glass fiber line.

17. The attachment according to any one of the claims 1 to 16, characterized in that the height (H) of the conductor (2), measured from the light-admission surface (6) to the tip (7) of the lower part (12), corresponds to the focal length of the detection unit (15), in particular of the intraoral camera, or that the height (H) of the attachment (1), measured from the light-admission surface (6) to the surface of the pad (3) facing away from the conductor (2), corresponds to the focal length of the detection unit (15), in particular the intraoral camera.

18. An illuminating device or a device for detecting or recording surface features, in particular colours, structures, etc., or an intraoral camera, comprising an attachment according to any one of the claims 1 to 17.